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Paper 8

Aspects of general Linguistics

Eirian Davies

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Paper No. 8

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ASPECTS OF GENERAL LINGUISTICS

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Introductory Note

The aim of this paper is to give a brief outline of the area of study of general linguistics together with an introductory sketch of some modern schools of thought in this discipline. Extensive references to original works, including page numbers, are given in footnotes so that readers may easily pursue further reading in those areas which interest them.[+] It is hoped that the paper will provide a background against which the reader may set the other papers in this series; both those dealing in detail with one linguistic description of English phonology and grammar, and those pedagogic papers dealing with the relevance of linguistics to the teaching of English in British schools, which, in their linguistic component, draw largely on that particular description of English, and on the general approach to the study of language from which it stems.

[+] Abbreviations used throughout footnotes:

T.P.S.	Transactions of the Philological Society, Oxford: Blackwell.

JL	Journal of Linguistics, published by Cambridge University Press for Linguistics Association of Great Britain.
Lg.	Language, published by Waverly Press, Baltimore, for Linguistic Society of America.
B.S.O.A.S.	Bulletin of the School of Oriental and African Studies.

1

The academic discipline of general linguistics is concerned with the study of that form of patterned human activity which we call language. Its area of study includes all known languages, at any and every known stage of their development. It also includes the human 'faculty of language' as such and, thirdly, the uses to which language is put in society. That is, in other terms, one might say that general linguistics has within its province the study of:

(i) the product (language);
(ii) the means of production (the human faculty of language); and
(iii) the employment of the product (the uses to which language is put in human society).

1.1

A great part of the work done in linguistics has been devoted to the first of these fields, that is, to the study of actual languages. Within this field, a distinction is drawn between the study of the development through time of a given language, or languages, on the one hand, and, on the other, the study of a language at a certain point in time - which need not be the present time - as a self-consistent system in itself. It was the Swiss scholar, Ferdinand de Saussure, who made this point most clearly and forcibly, in lectures given at Geneva from 1906 to 1911, and afterwards reconstructed from students' notes and published as Cours de Linguistique Générale,(1) in 1915, although Henry Sweet had previously noted it in his Middle English Primer(2) as long ago as 1867. de Saussure called the study of the development of a language 'diachronic linguistics', and the study of a language at a given point in its history 'synchronic linguistics'. The former kind of study has since often been referred to as 'historical linguistics', and the latter as 'descriptive linguistics'; these are the terms which will be used here.

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(1) F. de Saussure: Cours de Linguistique Générale (1915), ed. Bally and Sechehaye, Paris: Payot. (5th edition 1962). Translated: Wade Baskin (1959) as Course in General Linguistics, The Philosophical Library Inc., New York. (McGraw-Hill paperback edition, New York 1966). Quotations in the text are from the translation, but those reading French are advised to read the original. Page references are given to the original, as well as to the paperback edition of the translation.

(2) H. Sweet: Middle English Primer (1867), London, O.U.P.

1.2

Broadly speaking, the great historical linguists of the nineteenth century,(3) whose scholarship produced among other things the monumental New English Dictionary, studied certain features in a given language, not so much in relation to one another but in relation to what they 'had been' and/or later 'became'. Descriptive linguists of the present century have, on the other hand, concentrated on the interrelation of such features with one another, leaving largely out of account the earlier or subsequent development of the language in question. It should be noted here that, although most of the descriptive work in modern linguistics has concentrated on the present state of the languages studied, descriptive studies may be, and sometimes have been, made of a past

(3) A survey of their work is given by H. Pedersen: (1924) Translated J.W. Spargo as The Discovery of Language: Linguistic Science in the 19th Century, (1931) Midland Book MB 40 Indiana University 1962.

state of a given language, or of a language now dead, so long as direct evidence of that state survives in the form of texts from that period. Finally, it should not be thought that all the linguistic work of any importance carried out in the nineteenth century was historical, or that no valuable contributions to historical linguistics have been made in this century. Studies in both areas have always been pursued side by side. It is, however, fair to think of linguistic studies in the century of Darwin as predominantly historical, and of those in the present century as predominantly descriptive.

1.3

Both in historical and in descriptive linguistics two or more languages are often compared for the sake of the light which they can throw on one another or on more general problems of linguistic history and structure. In historical linguistics this technique has been much used for the establishment of families of languages, and for tracing the descent from one ancient tongue of different languages now used in communities that may be widely separated both geographically and culturally: an example of this would be Hindi and English, which both belong to the Indo-European family of languages. The technique has also shown, in some instances, that two languages spoken by communities in close geographical and cultural contact may not be historically related at all: as, for example, in the case of Hungarian which belongs to the Finno-Ugrian branch of the Uralian family of languages, and Roumanian which belongs to the Italic branch of Indo-European. Comparison between languages in this approach tends to be made with reference to historically early stages where they converge on each other in approaching a common origin, rather than to more modern times.

1.4

In the hands of descriptive linguists the comparison of languages has been done chiefly on the basis of their present forms; that is, the synchronic approach has been chiefly concerned with the contemporary study of languages. One of the results of some of these comparisons has been to show that two languages which are historically unrelated, but which are spoken by communities in close geographical and cultural contact, may have certain similarities and parallel features. For example, F.R.

Palmer in an article on Ethiopian Semitic(4) notes that the languages Tigrinya and Bilin, which are spoken by peoples who are geographically and culturally closely related to one another, have certain phonological features in common such as the availability among the phonemes of the language of four different laryngeal sounds (represented by /h, ɔ , h, ^{c}/) but no voiceless bilabial stop (/p/) — although they are historically, or 'genetically' as he terms it, unrelated to one another.

The comparative approach in historical linguistics is often referred to as Comparative Philology: in descriptive studies it is sometimes called Comparative Linguistics, also Comparative Descriptive Linguistics or Contrastive Linguistics.

2

The study of languages is as old as civilisation, but so, too, is interest in the human faculty which creates and uses language, and in the relationship between this faculty and the language it creates. In the West, studies in this area may be traced as far back as the writings of Plato and Aristotle, and on from them through the work of medieval grammarians to that of the philosophical grammarians of the seventeenth and eighteenth centuries.

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(4) F.R. Palmer: 'Comparative statement and Ethiopian Semitic' (1958), T.P.S. 1958-9, p. 119-143.

2.1

Certain of the weaknesses in traditional school grammar text books - weaknesses, that is, in the light of modern linguistic knowledge - such as the use only of notional criteria to define parts of speech, may be traced back to poor imitations of works in philosophical grammar. Others, however, such as the use of categories derived from Latin grammar to describe the grammar of English, are unconnected with any link which those books may have with philosophical grammar, the province of which may loosely be said to be 'what lies behind the linguistic fact'.

For the limited purposes of this paper, the study of the human faculty of language will be referred to as 'philosophical grammar'. In the nineteenth century, although there was considerable philosophising about grammar, there was little philosophical grammar in the present sense: most of the studies were historically oriented, and they included many attempts to deduce the history and origin of the Indo-European peoples from the histories and inter-relationships of their languages. That is, it was attempted to use linguistic facts to throw light on social history. This approach has been criticised in the present century as being insufficiently focussed on language in itself to be the proper object of a 'true linguistics'.

2.2

During the first half of this century the first connections were postulated between the new knowledge of psychology and linguistic patternings. The work of Karl Bühler influenced many European linguists. In Sprachtheorie, 1934,(5) he postulated three basic functions of language, namely: expression (Ausdruck), conation (Appel) and reference (Darstellung). In Bühler's scheme, the expressive function of language has to do with the verbalisation of the speaker's feelings, the conative with attempts by the speaker to provoke a reaction of some kind on the part of the addressee, and the referential with the 'real' objects and processes of the extra-linguistic world.

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(5) K. Bühler: Sprachtheorie (1934), Jena.

2.3

A.V. Isacenko in an article called 'On the conative function of language',(6) writes: 'Taking Plato's view as his point of departure, Bühler defines language as an "organon" which enables "somebody to tell somebody else something about objects". In this scheme three poles must be clearly distinguished: "somebody", i.e. the speaker; "somebody else", i.e. the listener or the addressee; and the "objects", i.e. the content of the utterance. A correlation of these three poles is given in any linguistic situation and is manifested by means of human speech ("to tell something"). Further on, Bühler defines the three basic functions of language by stating that in any linguistic manifestation one of the three poles prevails.' Bühler, in fact, although a psychologist, concentrates chiefly on the functions of language

(6) A.V. Isacenko: (1948) Translated by the author as 'On the conative function of language' in A Prague School Reader in Linguistics (1964), ed. J. Vachek, Indiana University Press, Bloomington, p. 88-97.

and on the relationship between these functions and the nature of language as a system of signs, rather than on the human faculty of language as such.

2.4

So, too, does the Prague School, (to which Isačenko belongs), one of the most important groups of linguists to take cognisance of Bühler's ideas. Their work, in turn, has had some influence on developments in linguistic theory in this country. Members of this group, apart from their considerable and significant contributions to phonological theory (which will be touched on later), have also paid attention to the ways in which the information carried by language in its 'referential function' may be structured in linguistic form. One of the founders of the Prague school, V. Mathesius, developed ideas on what came to be called the 'functional sentence perspective'.(7) He distinguished essentially between

(7) V. Mathesius: i) 'On Linguistic Characterology with Illustrations from Modern English' in Actes du Premier Congrès International de Linguistes à la Haye (1928), p. 56-63. Reprinted in: A Prague School Reader in Linguistics, p. 59-67.
ii) 'On Some Problems of the Systematic Analysis of Grammar', Travaux du Cercle Linguistique de Prague 6 (1936), p. 95-107. Reprinted in A Prague School Reader in Linguistics, p. 306-319.

given and new information, and this led him to make a parallel distinction between two parts of sentence structure, which he called 'theme' and 'rheme' respectively. The 'theme' constitutes the subject in the sense of being 'that which is talked about'. It is 'that part of the utterance which refers to a fact or facts already known from the preceding context, or to facts that may be taken for granted, and thus does not, or does only minimally, contribute to the information provided by the given sentence-utterance. The other part (of the sentence-utterance) now usually called the "rheme", contains the new information to be conveyed by the sentence-utterance and thus substantially enriches the knowledge of the listener or reader'.(8)

2.5

The work of the Prague school in general has been concerned with language in action as a means of communication, rather than with problems of how language is created in the human brain, and it would be fair to say

(8) J. Vachek: The Linguistic School of Prague (1966), Indiana University Press, Bloomington and London, p. 89-93.

of the linguists of this school that they were among the first seriously to consider the relation between the form of linguistic patternings and the uses to which language is put in society.

2.6

Another important group of linguists who considered this relationship between the form and the uses of language was the British school, which was centred on London from the early 1930s under the leadership of J.R. Firth who became the first Professor of General Linguistics in the country. Firth was influenced both by the anthropologist Malinowski,(9) and by theories of role and role playing then being developed in the United States by social psychologists, among whom were Mead and Cooley. Firth's concept that 'the context of situation' of an utterance must be adequately described before its full meaning could be considered to have been stated was in marked contrast with the standpoint of his contemporary

(9) B. Malinowski: 'The problem of meaning in primitive languages', supplement 1 in Ogden and Richards: The Meaning of Meaning (1923), Routledge and Kegan Paul, London, p. 296-336.

linguists in America; many of these, in the course of developing (and sometimes distorting) the ideas put forward by Leonard Bloomfield in his book Language (1933)(10) were seeking to study linguistic form so much in and for itself that whenever possible they took into consideration nothing else at all, and sometimes even attempted to describe it in isolation from its meaning.

A strong reaction against this last approach followed in the United States in the work of Noam Chomsky and others. Chomsky's book Syntactic Structures(11) published in 1957, and the work in generative linguistic theory of a particular kind ('transformational grammar') that followed from it, marks a return to the study of the human faculty of language production, by a large and influential body of linguists in America and elsewhere.

(10) Leonard Bloomfield: Language (1933), British edition 1935. London: George Allen and Unwin.

(11) Noam Chomsky: Syntactic Structures (1957), Mouton and Co., The Hague.

Chomsky himself in his book Cartesian Linguistics (1966)(12) suggests links between the generative theory he himself has pioneered and the work of philosophical grammarians of the seventeenth century, in particular of the Port Royale grammarians in the Paris of the 1660s. Chomsky deals with two aspects of this area. The first is concerned with language learning, and the second with language production: in the first, he considers the way in which the human brain interprets and organises the vast amount of language data which the young child receives as 'input' to his language faculty: in the second he considers the linguistic output of this human faculty, and in particular examines the way in which, with finite resources, it can produce a potentially infinite number of different sentences. With respect to the way in which young children acquire their native language, that is, the way in which they deal with linguistic input, Chomsky postulates the existence of a built-in set of generalised rules or principles which constitute a 'language learning device' common to all normal

(12) Noam Chomsky: Cartesian Linguistics (1966). Harper and Row, New York and London.

human beings in the same basic form. With respect to the linguistic output of the human brain, he makes a distinction between what he calls 'competence' and 'performance'.(13) Competence he describes as 'the speaker-hearer's knowledge of his language', and performance as 'the actual use of language in concrete situations'. Competence then is the product of the language learning device; it is 'the knowledge of the language that provides the basis for actual use of language by the speaker-hearer'. Chomsky seeks to establish a theory which will be able to explain the internal structure of the language learning device, and so show how its output arises from its input.

3.1

Chomsky sums up his view of the linguist's job as follows: 'The problem for the linguist, as well as for the child learning the language, is to determine from the data of performance the underlying system of rules that has been mastered by the speaker-hearer and that he puts to use in actual performance'. He continues by stating:

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(13) Noam Chomsky: Aspects of the Theory of Syntax (1965), Cambridge, Massachusetts: MIT Press, p. 4,8.

'Hence, in the technical sense, linguistic theory is mentalistic, since it is concerned with discovering a mental reality underlying actual behaviour'; elsewhere he says: 'Any interesting generative grammar will be dealing, for the most part, with mental processes that are far beyond the level of actual or even potential consciousness'. His 'mentalistic' position here is far removed from the general view adopted by most neo-Bloomfieldian linguists that nothing which is not directly deducible from observed facts, that is, from actual language events in concrete situations, can be legitimately stated or scientifically known about any language. Of their position Chomsky writes: 'Observed use of language or hypothesised dispositions to respond, habits, and so on, may provide evidence as to the nature of this mental reality, but surely cannot constitute the actual subject matter of linguistics'.

3.2

Chomsky also emphasises the 'creative' aspect which he says that all languages have in common:(14) 'An essential property of language is that it provides the

(14) Noam Chomsky: Aspects, p. 6.

means for expressing indefinitely many thoughts and for reacting appropriately in an indefinite range of new situations. The grammar of a particular language, then, is to be supplemented by a universal grammar that accommodates the creative aspect of language use and expresses the deep-seated regularities which, being universal, are omitted (by traditional grammars) from the (particular) grammar itself.' These 'deep-seated regularities' or linguistic universals must, in Chomsky's view, be explicitly stated in the description of the speaker-hearer's competence, which is the proper concern of linguistic studies.

3.3

Finally, Chomsky's own definition of 'generative grammar' should be quoted at some length:(15)

> ...by a generative grammar I mean simply a system of rules that in some explicit and well-defined way assigns structural descriptions to sentences. ...a generative grammar is not a model for a speaker or a hearer. It attempts to characterize in the most neutral possible terms the knowledge of the language that provides the basis for actual use of language by a speaker-hearer. When we speak of a grammar as generating a sentence with a

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(15) Noam Chomsky: Aspects, p. 8-9.

> certain structural description, we mean simply that the grammar assigns this structural description to the sentence. When we say that a sentence has a certain derivation with respect to a particular generative grammar, we say nothing about how the speaker or hearer might proceed, in some practical or efficient way, to construct such a derivation. These questions, belong to a theory of language use - the theory of performance.

3.4

Chomsky's grammar is not the only contemporary model which qualifies as 'generative' when this is taken to mean 'a system of rules that in some explicit and well-defined way assigns structural descriptions to sentences'. M.A.K. Halliday's less formalised system-structure approach(16)

(16) M.A.K. Halliday:
- (i) 'Categories of the Theory of Grammar' (1961), *Word* 17, p. 241-292.
- (ii) *The Linguistic Sciences and Language Teaching* (1964), London: Longmans.
- (iii) 'Syntax and the consumer' in C.I.J.M. Stuart (ed.) (1964), *Report of the Fifteenth Annual (First International) Round Table Meeting on Linguistics and Language Studies* (Monograph Series on Language and Linguistics 17), Washington D.C.: Georgetown U.P., p. 11-24.
- (iv) 'Some notes on "deep" grammar' (1966), *J.L.* 2^1, p. 57-67.
- (v) *Grammar, Society and the Noun* (1967), (Inaugural Lecture), London: H.K. Lewis for University College London.
- (vi) 'Notes on Transitivity and Theme in English' Part I (1967), *J.L.* 3^1, p. 37-81.
- (vii) 'Notes on Transitivity and Theme in English' Part II (1967), *J.L.* 3^2, p. 199-244. Part III forthcoming in *J.L.*

('systemic grammar', sometimes known as 'scale and category') and Sydney Lamb's 'stratificational grammar' (17) are both generative in this sense, although neither of these linguists accepts Chomsky's sharp distinction between competence and performance and neither model makes use of 'transformations', a term and device taken over by Chomsky from mathematics.

4

Some of the differences between Chomsky and his followers, and the 'neo-Bloomfieldians' who preceded them as the dominant school of linguists in the United States, have now been indicated. It should not be thought, though, that all American linguists of consequence in the years between 1933 and the late 1950s were devoted to an approach which sought to avoid, where possible, recourse to meaning in linguistic analysis. Among the notable exceptions was Kenneth L. Pike of the University of Michigan, who developed a linguistic approach now known as 'tagmemic grammar' or 'tagmemics'.(18)

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(17) Sydney M. Lamb:
  (i) Outline of Stratificational Grammar (1966) Washington, D.C.: Georgetown University Press.
  (ii) 'Linguistic structure and the production and decoding of discourse' (1966) in Victor E. Hall (ed.), Speech, Language and Communication, U.C.L.A. Forum in Medical Sciences, Berkeley and Los Angeles: University of California Press, p. 173-199.
  (iii) 'On Alternation, Transformation, Realization, and Stratification' (1964) in Report of the Fifteenth Annual (First International) Round Table Meeting on Linguistics and Language Study (Monograph Series on Language and Linguistics 17), Washington D.C.: Georgetown U.P. p. 105-122.

4.1

Pike, though his theory is certainly not mentalistic in Chomsky's sense, acknowledges that he has frequent and fruitful recourse to meaning in the process of linguistic analysis. He, and the group of linguists who have worked

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(18) K.L. Pike: Language in relation to a unified theory of the structure of human behaviour (1954-60), published in one volume, 1967. The Hague: Mouton.

see also:

R.E. Longacre: (i) 'String constituent analysis' (1960), Lg.36 (1960), p. 63-88.

(ii) Grammar discovery procedures (1964), The Hague: Mouton.

See R.H. Robins: A Short History of Linguistics (1967), London: Longmans, p. 212, for a summary of the tagmeme concept.

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with him, have in many ways had more in common with Firth and the London school than with any of their fellow countrymen in their approach to the study of languages. Pike's concepts of 'slots' and 'fillers' has a good deal in common with the 'elements of structure' of Firth and of Halliday. Basically they involve the distinction between a function in a grammatical string on the one hand, and the nature of what occurs there on the other; so that, to take an example from Halliday's earlier work, the first 'place' or 'function' in a given English clause might be labelled 'subject', and might be 'filled' by a single noun, such as John, or by a more complicated nominal string such as the old men of the village. A tagmeme is constituted by the combination of a slot or function and the class of items which can fill it.

4.2

The two schools also resemble each other in other respects, the most fundamental of which may be said to be their sociological orientation, and their concern with language in practical use. Under Pike's leadership, the Summer Institute of Linguistics became a training centre for many linguists, who then proceeded to remote areas in

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South America and elsewhere, where they learnt the language of an indigenous tribe, made a linguistic description of it in terms of Pike's theory of description, and then later proceeded to translate as much as possible of the Bible into the language in question. One side effect of this has been that many languages which might otherwise have died out, unknown to any except their native speakers, are now preserved in written form for posterity.

4.3

All linguists of this period took an active interest in languages other than their mother tongue: members of the London school described many languages in Africa, the Middle East and South East Asia; Bloomfieldian linguists in the United States made extensive studies of the languages of the North American Indians. Even so the contribution made by the members of Pike's Summer Institute to knowledge of the range and variety of human languages may be considered an outstanding one, and their work in this field continues. Pike was a contemporary of Bloomfield's, whom he long survives, but his Summer Institute is still expanding each year, and has a branch in Britain as well as in other places outside the States.

The sheer quantity of previously unknown languages described by Pike and his followers is by no means their only, or indeed their chief, claim to fame: important theoretical developments may be traced in their writings across the years, all of which have had to a high degree that close relationship with experience, both as their stimulus and their test, which Firth, too, thought essential to healthy theoretical growth.

4.4

In his largest work, Language in relation to a unified theory of the structure of human behaviour, Pike has set his horizons wide: he places language in the perspective of life as it is lived in different types of society in an attempt to present a fundamentally integrated approach to the study of human language and life. In this attempt, Pike is very much in tune with Firth's attitude, as expressed in the central importance which he gave in his theory of meaning to the concept of the 'context of situation', and in his often quoted remark that 'people use language to live': though Firth's written works provide only a partial indication of the range of his thought.

5

Mention was made earlier of de Saussure, but only in connection with his distinction between synchronic and diachronic linguistics. Among his other important contributions to linguistic theory are two further dichotomies which he sought to establish: that between 'langue' and 'parole'; and that between 'forme' and 'substance'. Of these, the former has much in common with Chomsky's distinction between 'competence' and 'performance'.(19) de Saussure himself characterised 'langue' as, among other things, 'localised in the limited segment of the speaking-circuit where an auditory image becomes associated with a concept', and as being social and supra-individual, the property and creation of the community as a whole, existing only by virtue of the tacit common consent of its members. 'Parole', on the other hand, is the use of 'langue' in actual situations, 'it is concerned with the audible part of the speaking-circuit', and it is both individual and heterogeneous.(20) 'Parole' is not the proper object of linguistic study.

(19) Noam Chomsky: Aspects, p. 4.

(20) F. de Saussure: Cours, p. 23-32, 36-39; Course, p. 7-15, 17-20.

5.1

The second distinction, that between 'forme' and 'substance', is partly bound up with the first in that it is central to de Saussure's explanation of the nature of 'la langue'. That is, language ('la langue') is a form and not a substance.(21) It is also connected with a further distinction of which de Saussure makes use, namely that between content (thought) and expression (sounds).

5.2

La langue (a form) is a system of oppositions between linguistic signs;(22) that is, each sign derives its 'value' in the system by virtue of being significantly distinct from all other signs in the system, and not by virtue of its own composition or nature. Linguistic values, then, are defined relatively in terms of the total system (la langue) in which they all play a part. Values, therefore, are derived from the system as a whole, and not from the elements of which the signs having value are themselves compounded.(23) de Saussure illustrates his point with an analogy from chess. If, during a game of chess one of the pieces, say a knight, were broken or lost, there would be nothing to stop the players using a different knight in its place. Moreover, they could use anything else that they chose, something perhaps which had not the least resemblance to any chess-piece, in place of the lost knight; and this would be considered equivalent to the knight as long as they agreed to assign it the same 'value'.(24) A match stick, for example, could be declared functionally equivalent in the system of values to a carved ivory chess-piece.

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(21) F. de Saussure: Cours, p. 157, 169; Course, p. 113, 122. (Note, however, that this second distinction does not parallel the first: that is, la parole is not seen as 'a substance'.)

(22) Cours, p. 168-9; Course, p. 122.

5.3

The central distinction between 'forme' and 'substance', then, is that 'forme' is a system of values, and 'substance' is to do with the nature of that which has a value in terms of the system, namely, the linguistic sign.

(23) Cours, p. 153-169; Course, p. 110-122.

(24) Cours. p. 153-4; Course, p. 110.

5.4

There are two kinds of substance which are relevant here: thought-substance (ideas), and expression-substance (sounds). The linguistic sign has a bi-partite nature.(25) That is, it results from the combination of these two different kinds of substance; it is a 'thought-sound'. In and by itself, substance of either kind is amorphous; but where the two sorts combine to produce a linguistic sign, each itself receives some structuring as a result. That is, only when a given part of phonic substance combines with a given part of thought substance to constitute a substance combination which is meaningfully distinct from all others - and therefore constitutes a linguistic sign having value in 'la langue' - do these 'parts of substance' constitute divisions in what would be otherwise the amorphous masses of sounds and ideas. de Saussure gives an analogy to clarify the point: 'Visualize the air in contact with a sheet of water; if the atmospheric pressure changes, the surface of the water will be broken up into a series of divisions, waves; the waves resemble the union or coupling of thought with

(25) Cours, p. 99-100, 115-157; Course, p. 66-67, 111-113.

phonic substance.(26)

5.5

In the linguistic sign neither kind of substance is seen as being logically prior to the other: that is, 'Neither are thoughts given material form, nor are sounds transformed into mental entities; the somewhat mysterious fact is rather that "thought-sound" implies division, and that language (la langue) works out its units while taking shape between two shapeless masses'. Again, in the sign, thought and sound are indivisible: 'The linguistic fact can ... be pictured in its totality - i.e. language (la langue) - as a series of contiguous subdivisions marked off on both the plane of jumbled ideas... and the equally vague plane of sounds'. And further on: 'Language (la langue) can also be compared with a sheet of paper: thought is the front and sound the back; one cannot cut the front without cutting the back at the same time; likewise in language, one can neither divide sound from thought, nor thought from sound; ...Linguistics then works in the borderland where the elements of sound and thought combine; their combination produces a form, not a substance'.

(26) Cours, p. 156; Course, p. 112.

5.6

However, it would be a great mistake 'to consider a term' (i.e. a value) 'as simply the union of a certain sound with a certain concept.... To define it in this way would be to isolate the term from its system; it would mean assuming that one can start from the terms' (i.e. values) 'and construct the system by adding them together when, on the contrary, it is from the interdependent whole that one must start and through analysis obtain its elements.(27)

5.7

To sum up: the definition of a value is relative; but the description of the linguistic sign (which has value) entails an account of its own composition: the combination of two different kinds of substance, those of thought and sound.

5.8

The work of Louis Hjelmslev, who was considerably influenced by de Saussure, should be mentioned here. Hjelmslev, together with H. Uldall, founded the 'glossematic' school of linguistics in Copenhagen, and was a contemporary of Firth, Bloomfield and Pike. His chief published work, which first appeared in Danish in 1943 and has now been translated into English as Prolegomena to a theory of language,(28) was an attempt to develop a systematic and logical framework in terms of which the description of texts might be achieved. He was influenced in his approach by de Saussure's plea for language to be studied in and for itself, and not as a means to some end,(29) and also by the Saussurean distinction between 'forme' and 'substance' outlined above.

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(27) Cours, p. 157; Course, p. 113.

5.9

One of Hjelmslev's many contributions to linguistic theory was to modify and develop de Saussure's approach to this question by introducing a third concept of his

(28) L. Hjelmslev: (1943) translated by F. J. Whitfield as Prolegomena to a theory of language (1953). Revised edition 1961. Madison, Wisconsin: University of Wisconsin Press.

(29) de Saussure: Cours, p. 20-35, 317; Course, p. 6-17, 232: 'The true and unique object of linguistics is language studied in and for itself'.

L. Hjelmslev: Prolegomena, p. 4-6.

own, namely 'purport', which he held to be applicable to both de Saussure's categories of content (ideas) and expression (sounds).(30) Taking the 'content plane' Hjelmslev illustrates 'purport' as being that which the following examples have in common - that is, 'the thought itself':(31)

1) jeg véd det ikke. (Danish)
2) I do not know. (English)
3) Je ne sais pas. (French)
4) en tiedä. (Finnish)
5) naluvara. (Eskimo)

He writes further: 'This purport, so considered, exists provisionally as an amorphous mass, an unanalyzed entity, which is defined only by its external functions, namely its functions to each of the linguistic sentences we have quoted'. (where 'functions' may be glossed as 'relations'.) ...'Each language lays down its own boundaries within the amorphous "thought-mass" and stresses different factors in it in different arrangements, puts the centre of gravity in different places and gives them different emphases. It is like one and the same handful of sand that is formed in quite different patterns, or like the cloud in the heavens that changes shape in Hamlet's view from minute to minute.'

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(30) L. Hjelmslev: Prolegomena, p. 49-60.

(31) Prolegomena, p. 50-52.

5.10

Hjelmslev has 'substance' as well as 'purport' and 'form'. Writing of the three in relation to one another he says: 'We recognise in the linguistic content ... a specific form, the content-form, which is independent of, and stands in arbitrary relation to, the purport, and forms it into a content-substance'; and he postulated the parallel case for the expression plane. Hjelmslev's 'form' might be said to have the nature of an organising principle which acts on 'purport' to produce 'substance'. This idea taken together with his concept of 'purport' may relevantly be borne in mind when considering B.L. Whorf's comparative work on some North American Indian languages - as contrasted with European languages - and his hypothesis of 'linguistic relativity', which will be touched on below.

5.11

Though Hjelmslev may not have attempted to state an integrated theory of human behaviour as Pike has done, yet the closing lines of his book present perhaps the most far ranging view of the role of linguistics which any linguist has given voice to:

> Linguistic theory is led by an inner necessity to recognise not merely the linguistic system, in its scheme and in its usage, in its totality and in its individuality, but also man and human society behind languages, and all man's sphere of knowledge through language. At that point linguistic theory has reached its prescribed goal: 'humanitas et universitas'.(32)

6

The work of Hjelmslev, whose school of glossematics continues in Denmark at the present day,(33) has also influenced linguistics in other countries: in the United States, Sydney Lamb has discussed Hjelmslev's approach to linguistic theory in an article entitled 'Epilegomena to a Theory of Language',(34) and has attributed to the Danish scholar an important influence on his own thought.

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(32) Prolegomena, p. 127.

(33) B. Siertsema: A study of glossematics (1955), Martinus Nijhoff, The Hague. 2nd edition 1965.

6.1

All recent work in linguistics owes much to that of Bloomfield, and those who followed him, both to their formulation of theoretical problems, together with the solutions for these which they proposed, and to the large number of descriptions of different languages which they made. Lamb freely acknowledges a debt to this earlier linguistic work, but his own approach differs from that of the neo-Bloomfieldians in certain fundamental respects. Unlike some of those who followed Bloomfield, Lamb takes the study of meaning to be central to all linguistic investigation. Stratificational grammar makes provision for the statement and description of individual meanings in the so-called 'hypersememic' and 'sememic' strata,(35) something which Bloomfield and those who followed him specifically sought to avoid.

(34) S. Lamb: 'Epilegomena to a Theory of Language' (1966), Romance Philology 19, p. 531-573.

(35) S. Lamb: Outline of Stratificational Grammar (1966), p. 1, 31-32.

6.2

In Language, Bloomfield wrote: 'The meanings of speech-forms could be scientifically defined only if all branches of science, including especially psychology and physiology, were close to perfection.'(36) In a later chapter he expanded on this:

> In order to give a scientifically accurate definition of meaning for every form of a language, we should have to have a scientifically accurate knowledge of everything in the speakers' world. The actual extent of human knowledge is very small, compared to this. We can define the meaning of a speech-form accurately when this meaning has to do with some matter of which we possess scientific knowledge. We can define the names of minerals, for example, in terms of chemistry and mineralogy, as when we say that the ordinary meaning of the English word salt is 'sodium chloride (NaCl)' ... but we have no precise way of defining words like love or hate, which concern situations that have not been accurately classified -- and these latter are in the great majority. Moreover, even where we have some scientific (that is, universally recognised and accurate) classification, we often find that the meanings of a language do not agree with this classification. The whale is in German called a fish... and the bat a mouse... The statement of meanings is therefore the weak point in language study, and will remain so until human knowledge advances very far beyond its present state. (37)

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(36) L. Bloomfield: Language, p. 78.
(37) L. Bloomfield: Language, p. 139-140.

And, further on:

> Our study ordinarily concerns only the distinctive features of form and meaning.(38)

6.3

Bloomfield himself, however, did not abjure all recourse to meaning in linguistics, though he distinguished it sharply from the description of meanings as such. That is, he was prepared to refer to differences in meaning ('distinctive features...of meaning') to establish the phonemes of a language:

> The study of significant speech-sounds is phonology or practical phonetics. Phonology involves the consideration of meanings... Phonology and, with it, all the semantic phase of language study, rests upon an assumption, the fundamental assumption of linguistics: we must assume that in every speech-community some utterances are alike in form and meaning...In order to recognize the distinctive features of forms in our own language, we need only determine which features of sound are 'different' for purposes of communication. (39)

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(38) Bloomfield: Language, p. 141.

(39) Bloomfield: Language, p. 78.

6.4

Bloomfield proceeded from this to a description of what has been called the 'minimal pairs technique'. That is, for example, taking the sounds [p] and [b] in English, these would be said in this approach to be different phonemes in the language on the basis of evidence such as the dissimilarity in meaning of the two words pore and bore. This would be done without any description of the actual meaning of either word: no reference to the surface of the skin or long-winded conversationalists is needed to establish the salient fact of difference in meaning. Bloomfield's definition of the phoneme followed from this: 'a minimum unit of distinctive sound feature.'(40)

6.5

Use of this technique does imply that each form compared means something recognisable to the linguistic analyst as well as to native speakers of the language in general; but this point tended to be omitted in some of the publications of the neo-Bloomfieldians, among whom several linguists laid stress on the use of distributional criteria for the establishment of phonemes, and sought to avoid any recourse to meaning wherever possible.

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(40) Bloomfield: Language, p. 79.

6.6

Essentially, the Bloomfieldian approach to linguistic analysis was best equipped to deal with those cases in language where a difference in form correlates directly (that is, in a one to one relationship) with a difference in meaning. Bloomfield developed his 'fundamental assumption' (quoted above) by adding that it implied: 'that each linguistic form has a constant and specific meaning. If the forms are phonemically different, we suppose that their meanings also are different....We suppose, in short, that there are no actual synonyms.(41) On the other hand he did recognise homonyms (or, more strictly, homophones), instancing 'bear' (to carry), 'bear' (ursa) and 'bare' (uncovered).

6.7

In practice, however, the Bloomfieldian admission of sounds which are phonetically, but not significantly, different to the 'membership' of one and the same phoneme

(41) Bloomfield: Language, p. 145.

(as 'allophones' of that phoneme) appears to amount to a tacit recognition of something which might be called 'phonological synonomy' (even though no phoneme has any referential meaning in its own right as a phoneme.) That is, sounds which are formally, but not meaningfully, distinct are grouped together.

6.8

In a parallel way, the same point could be made with respect to some of the Bloomfieldian work on morphemes, the minimal meaningful units of a language, or 'ultimate constituents'.(42) Taking the much quoted example of the plural forms of English nouns, three main 'phonological shapes' may be said to be 'allomorphs' (on the analogy with 'allophones') of the plural morpheme: that is, /s/ as in cats, /z/ as in dogs and /iz/ as in horses. (This is to ignore for the moment forms like sheep, oxen, mice, and children which also enter into the picture, and complicate it). These three phonological entities may be said to be allomorphs of the one plural morpheme on the grounds that each fulfils the same grammatical function; or to put it another way, that each has the same grammatical meaning. It would appear that an underlying concept of 'grammatical synonomy' is operative here: in fact, an approach which makes use of the criterion same or different in meaning when comparing different forms already implies that the answer may sometimes be same: otherwise the question would not be thought worth asking.

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(42) Bloomfield: Language, p. 161. cf. also: p. 164... 'we should say that the morpheme in such cases has two (or sometimes more) different phonetic forms'.

6.9

To a certain extent, then, the Bloomfieldian approach was equipped to deal with what Lamb describes as 'discrepancies' between 'strata',(43) that is, those cases where there is not a one to one correspondence between, for example, a morpheme and the phoneme or combination of phonemes, to which it is related. It could deal with cases such as the plural of English nouns, just discussed; and also conversely with what might be termed 'grammatical homonymy' in instances such as /s/ and /z/ in English which are allomorphs not only of the nominal plural morpheme but also of the 3rd person singular verbal present

(43) S. Lamb: 'Linguistic Structure and the production and decoding of discourse', p.173-177. cf. note 17.

morpheme, as in breaks /breiks/ and digs /digz/ respectively. However, the neo-Bloomfieldians tended to regard such instances as problematical and troublesome: they were seen more as difficult exceptions than as exemplifying a central, and useful, type of linguistic relationship.

6.10

Lamb, on the other hand, has built in these and other discrepancy relationships as a central part of his theory, which is designed among other things to account for the power of language to formulate an infinite number of thoughts and meanings using only a limited number of meaningfully distinct minimum sound segments.(44) In order to achieve this, Lamb argues, there must be a great deal of discrepancy between the various strata (or levels of analysis) in languages; and also more levels than have been generally recognised between which, so to speak, there is room for such discrepancies to exist.

6.11

Lamb's approach to this question enables him not only to deal efficiently with the two types of discrepancy so

(44) S. Lamb: Outline, p. 1-2.

far discussed, but also to cope with other kinds which provided more of a stumbling-block to some of the neo-Bloomfieldians. In particular, a case which Lamb refers to as 'portmanteau realization'.(45) An example of this is the relationship between bad + er and worse. Worse may be described as bad + the comparative form -er: but no part of this item is formally related to either bad or -er. To someone seeking to give a phonological definition to the comparative morpheme, instances such as this provide a difficult problem. In Lamb's theory, however, one is free to note this relationship of two parts 'realized' (at a lower stratum) as one whole which is different from both of them, without this involving theoretical complications. This is largely because for Lamb, the morpheme is not composed of the sum of constituent phonemes (as Bloomfield and some of the neo-Bloomfieldians held it to be);(46) neither is the morpheme the 'class of combinations of...phonemes, called its allomorphs' as many linguists have viewed it.(47)

(45) Lamb: Outline, p.33.

(46) Bloomfield: Language, p. 161.

(47) Lamb: Outline, p. 32-33.

6.12

The morpheme, for Lamb, is phonologically realised, but not phonologically defined. He is thus freed from the restrictions of the 'consists of' approach to the relationship between morpheme and phoneme; and also from those of the second approach above, that of 'class of allomorphs' which fails to account for 'portmanteau realization' because this would involve an entity (worse in the example) being a member simultaneously of two classes (represented in the example by bad and -er) but only when they are concatenated. This is not allowable in set theory.(48)

6.13

Lamb, therefore, among other things differs from the Bloomfieldians in terms of his treatment of meaning; his treatment of 'discrepancy' relationships between units on different strata (i.e. levels); and the number of strata that he postulates, (six, as opposed to the Bloomfieldians two, or, in some cases, one only). Where Lamb brings into focus 'the discrepancies from a simple relationship' between meaning and sound, his work marks an advance not

(48) Lamb: Outline, p. 33.

only on Bloomfield's approach, but also on those of de Saussure and Hjelmslev.

6.14

Some of the discrepancy relationships which are accounted for in Lamb's theory provide the motivation for the distinction between surface and deep grammar (or structure) which has been drawn by both Chomsky and Halliday, and, earlier, by Hockett. In fact, it is perhaps chiefly in this respect, the specific recognition of and concern with basic patterns of asymmetry between elements at different levels of linguistic patterning, that recent work in linguistics may be distinguished from that of many earlier scholars.

7.

One should not leave present-day linguistics in the United States without some mention of the dependency-model theory of grammar, developed chiefly by D.G. Hays and his associates in the Rand Corporation.(49) This

(49) D.G. Hays: (i) 'Dependency Theory: A formalism and some observations' (1964), Language, 40, 4 p.511-525.
(ii) 'An Annotated Bibliography of Publications on Dependency Theory' (1965), Rand Memorandum. RM-4479-PR March 1965, Santa Monica California.

approach is oriented to the task of programming computers to make a linguistic analysis of natural language texts, with the eventual aim of machine translation between two different natural languages. Applied to English this approach is concerned chiefly with the relationships between the parts of speech in a sentence, of which the verb is seen as central, being that one to which all the other parts of the sentence are connected and on which in this sense they all depend. In as far as it deals in dependence as the dominant linguistic relationship, this approach may be related to that of Hjelmslev, though it lacks perhaps the profundity and scope of his thinking; it is not, neither does it claim to be, 'humanitas et universitas'. The dependency model is based, in its own structure, on a foundation of mathematical logic. This is true also of 'categorial grammar' as developed by Y. Bar-Hillel of the Hebrew University in Jerusalem, and of the work of the Soviet linguist Saumjan. Bar-Hillel's book, Language and Information,(50) published in 1964, is in fact of as much interest to mathematicians and logicians as it is to linguists.

(50) Y. Bar-Hillel: Language and Information (1964), Reading, Massachusetts: Addison-Wesley.

7.1

Of all the approaches sketched here, the three discussed in the last paragraph are perhaps the most exclusively concerned with the 'product' (language'), without striving to relate it theoretically either to the 'means of production' or to the purposes for which it is used in society. But this concentration on the 'product' is not an inevitable outcome of their mathematical foundation, or of their accompanying interest in the logical properties of the structure of grammatical models as such. It should not be forgotten that Chomsky has also done much work on the latter, and that his own model of grammar is based on mathematical logic. He was, in fact, a pioneer in the field of applying some of the principles of this discipline to the study of natural languages, and the term 'transformation' in his 'transformational grammar' comes from there. But Chomsky's work, and that of his followers, also relates to the 'means of production' and the relationship between language and the human brain, as discussed earlier. It is therefore more widely based than that of the other 'mathematical grammarians' just referred to, and also differs from theirs in being concerned with the sound patterns of languages, which they, centring their work on the written language, tend not to be.

7.2

The term 'model' deserves some attention here. It may be roughly defined as a self-consistent framework in terms of which a linguistic description of a language may be ordered and set forth: it provides an interrelated set of categories, relations, and operations, in terms of which such a description may be both made and stated. Different descriptions of one language may be made in the terms of the one model: such descriptions would then differ either in their view of the nature of the 'facts' of that language, or of the interpretation of the significance of those facts, but not with respect to the terms of reference within which such facts and interpretations should be dealt with.

7.3

For example, R.B. Lees, in an article in 1960,(51) which was written in terms of the then-current version of

(51) R.B. Lees: 'A Multiply Ambiguous Adjectival Construction' (1960), Language 36, 2, p. 207-221.

transformational grammar, examined the English sentence, He is splendid to wait. He analysed this as being derived from two source sentences, He is splendid, and He waits, by the operation of a transformational rule, and treated the infinitive to wait as a modifier of the adjective splendid. Dwight L. Bolinger, in an article replying to Lees' paper,(52) preferred to regard the infinitive in constructions of this type as modifying not only the adjective but the whole proposition expressed in the other source sentence, that is, in this example, He is splendid. But he did not question that sentences of this type are derived from other, 'source' sentences by transformational rules. Although the article contains some criticisms both of the theory and practice of linguists working in transformational-generative grammar, it is itself written within the framework and in the terms of that model. Within the terms of another model, for example that of Pike, it would be meaningless to attempt to discuss source sentences or the nature of the transformational rules by which another sentence may be der-

(52) D.L. Bolinger: 'Syntactic blends and other matters' (1961), Language 37, 3, p. 366-381 (especially 370).

ived from them, because his model does not describe language in terms of either.

8

Linguists whose work is strongly influenced by Firth's ideas are to be found at many centres in Britain today, and their writings, it is felt, may be of especial interest to the readers of this paper. In particular, members and former members of the Department of Phonetics and Linguistics at the School of Oriental and African Studies in London have published many studies in prosodic phonology (discussed below) which Firth pioneered, together with work on other aspects of his theories.(53)

(53) J.R. Firth, ed.: Studies in Linguistic Analysis (1957), Oxford: Basil Blackwell. (A special publication of the Philological Society).
K.H. Albrow: 'The phonology of the personal forms of the verb in Russian' (1962), Archivum Linguisticum 14, p. 146-156.
J. Carnochan: 'Vowel harmony in Igbo' (1960), African Language Studies 1, p. 155-63.
E.J.A. Henderson: 'Prosodies in Siamese' (1949) in Asia Major, new series, 1, p. 189-215.
F.R. Palmer: 'The verb in Bilin' (1957) BSOAS 19, p. 131-159.
R.H. Robins: 'Aspects of Prosodic Analysis' (1957) in Proceedings of the University of Durham Philosophical Society Series B (Arts), 1, p. 1-12.
N.C. Scott: 'A phonological analysis of the Szechuanese monosyllable' (1950), BSOAS 18, p. 556-60. /

At University College London, the Survey of English Usage under the direction of Professor Randolph Quirk is, in its concern with the way in which language is used in society, and its concentration on the description of actual texts, as well as in other matters of general approach, based on the Firthian tradition: as is the systemic model of grammar developed by Professor M.A.K. Halliday. Several of the recent publications by linguists in this tradition are of particular relevance to those interested in relating linguistics to the teaching of English. They may be found listed in the annotated bibliographies compiled by Stephen Lushington which form part of the same series of papers as the present one.

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(53) Continued

N. Waterson: 'Some aspects of the phonology of the nominal forms of the Turkish word' (1956), BSOAS 18, 3, 1956, p. 578-591.

C.E. Bazell, J.C. Catford, M.A.K. Halliday, R.H. Robins (editors): In memory of J.R. Firth (1966), London: Longmans.

8.1

Firth, as mentioned above, was concerned with the context in which an utterance is produced as well as with the formal linguistic properties of the utterance itself, and his often quoted remark that 'people use language to live', is a useful guide to the general orientation of his thinking. Together with his pioneering work on prosodic phonology which is perhaps his best known legacy to linguistic studies, his concept of the spectrum of meaning is an extremely interesting and fundamental contribution to linguistic theory.(54) Firth described different types of meaning, including phonological, grammatical, lexical and contextual, and his 'dispersal' of meaning into various kinds for the purposes of linguistic analysis involved as its corollary the idea of 'full meaning' as the combination of these different kinds, just as in the spectrum the combination of the different colours results in white or 'full' light. Firth, moreover, insisted on the interrelation of the different levels of form — phonology, grammar, lexis and so on — so that for him knowledge of grammatical and lexical patterns of a language would influence the way in which the linguist would set up his phonological description of its sounds.

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(54) J.R. Firth: 'Modes of Meaning' (1951) in Papers in Linguistics 1934-1951 (1957), London: O.U.P.p.192.

Also, op. cit.: 'The Technique of Semantics' (1935), p. 7-33.

8.2

Halliday's systemic model of grammar is in the Firthian tradition with respect both to the dispersal of meaning, and the sociological orientation.

Halliday, however, in his recent work, has made a fundamental advance in the approach to meaning;(55) for within Firth's grammatical meaning he now distinguishes four different components, which are directly related to four of the different, but simultaneously performed, functions of language in social use. These four different components he has exemplified chiefly in his grammatical analysis of the English clause. They are: discourse component, experiential component, logical component, and component of speech-function. The discourse component, 'concerns the structuring of the act of communication within the total framework of a discourse, the

(55) M.A.K. Halliday: 'Options and functions in the English clause', (forthcoming article).

delimitation of message units and the distribution of information within them'. The experiential component is concerned with 'informing of the factual, objective content of extra-linguistic reality'. The logical component has to do with the logical relationships, principally the and and or relationships, which may be established and expressed between units of linguistic form. The speech-function component concerns 'the relations among the participants in a speech situation and the speech roles assigned by the speaker to himself and his interlocutors'.

8.3

These four components of grammatical meaning, which are all related, on the one hand, to formal properties in the grammatical patterns of the language, and on the other to the functions which the language performs in use, provide different but complementary and equally necessary ways of approach to any given text. Looked at informally, the discourse component has to do with the way in which the speaker organises the presentation of what he has to say, and, following from this, the ways in which one segment of linguistic form may be shown to be related to others (which may either precede or follow it) in terms of cross reference, relative emphasis and so on. The experiential component, having to do with that function of language which is most widely and easily accepted, roughly, the reporting of 'facts', is perhaps more readily understood. The speech function component deals with correlations between formal grammatical patterns and different relationships among participants in a speech situation, and the different roles they take up.

8.4

An example may help to illustrate this approach. Taking: John hit the ball and Bill caught it, one may say that there are two clauses, joined to one another by the combinatory logical connective and. In terms of the other three components, both clauses are alike. 'Transitivity' is the name given by Halliday to patterns of grammatical choice in the clause which relate to the experiential component. Here, both clauses in terms of transitivity may be said to be 'process clauses', each having - in one possible analysis - an actor (John and Bill respectively) and a goal (the ball and it), together with a 'process' verb (hit and caught).

8.5

'Mood' is the name given to the network of grammatical choices in the clause which corresponds with speech function. Both these clauses, in terms of Mood, may be said to be indicative and declarative (as opposed to interrogative, Did John hit the ball?, or imperative, John, hit the ball! or Let John hit the ball, etc.).

8.6

The network of grammatical choices in the clause relating to the discourse component is known as 'Theme'. This use of theme should not be confused with that discussed in Section 2.5 above; the term is used both as a general name for one of the networks of systemic choices applicable to the English clause, as here, and as the name for a particular role in the distribution of information in the clause as message. In both clauses under discussion the actor-subject (John, Bill) comes first in its clause, and is said to be 'thematic'. It is accorded some prominence by occurring in initial position in this way. This prominence may be further emphasised by a device which Halliday calls 'theme predication', as in: It was John who hit the ball (and not Bill or Peter).

On the other hand it is by no means always true that the actor-subject is given prominence in an English clause. It can be relegated to a quite insignificant position in the structure of the message, and the goal highlighted instead, as in: It was the ball (which) John hit (and not the stumps). Cross reference may be present as in It was that old ball which John hit or It was the other John who hit the ball, and so on. The possibilities of variation are wide, and have been described by Halliday in detail. Here, however, it is only as an illustration of his current approach to the spectrum of meaning that they are introduced.

8.7

Mention was made earlier (in section 2.4) of the Prague school of linguists, chiefly in connection with their work between the two world wars, in the days of their founder and leader V. Matthesius. This school continues to flourish and has recently begun once more to publish an annual journal(56) comprising papers written by Czech and Slovak linguists, including some founder members, such as B. Trnka and J. Vachek. Several members of the group, among them Danes, Firbas and Poldauf, are putting forward ideas much in harmony with some of the work in Systemic grammar being done in this country. The recent work of this group continues to be concerned with the relationship between linguistic patterns and the purposes for which language is used in society, and the description given by R. Jakobson to the Prague approach which he calls a 'means-end model' remains an apt one.(57)

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(56) Travaux Linguistiques de Prague (New Series), Prague: Ceskoslovenska akademie ved.

8.8

Finally, no discussion of work done on the relationship between language and the uses to which it is put in human society can fail to mention the names of Sapir and Whorf.

Sapir was a contemporary of Bloomfield's and, like him, studied several of the languages of the North American Indians. Unlike Bloomfield, however, Sapir did

(57) R. Jakobson: 'Efforts toward a Means-Ends Model of Language in Interwar Continental Linguistics' (1962) in: Trends in European and American Linguistics 1930-1960, II. Utrecht 1963. Reprinted in: A Prague School Reader in Linguistics, p. 481-484.

not deprecate recourse to meaning in the process of linguistic analysis. He was an anthropologist as well as a linguist, and was deeply interested in the role which language plays in human societies, and in the relation between language and culture. His attitude here may be best summed up by a quotation from his essay The Status of Linguistics as a Science,(58) in which he says: 'Language is a cultural or social product, and must be understood as such'. As his editor Mandelbaum says: 'He reminded linguists that, if their subject was to be scientifically productive and aesthetically satisfying, it could not be narrowly circumscribed, but had to be an integral and integrated part of the study of man'. In another essay entitled Language(59) Sapir writes that:

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(58) E. Sapir: 'The Status of Linguistics as a Science' (1929), Language V, p. 207-214. Reprinted in: Culture, Language and Personality (1961), selected essays edited by David G. Mandelbaum, Berkeley and Los Angeles: University of California Press, p. 65-78.

(59) E. Sapir: 'Language' (1933), op. cit., p. 1-45. (First published in 1933 in Encyclopedia of the Social Sciences, New York: MacMillan. Vol. 9, p. 155-169.)

'Besides the very general function which language fulfils in the spheres of thought, communication, and expression which are implicit in its very nature, there may be pointed out a number of special derivatives of these which are of particular interest to students of society'. Under this heading of 'special derivatives' he lists the function of language as 'a great force of socialisation', and also its use in 'cultural accumulation and historical transmission'. Finally he writes: 'In spite of the fact that language acts as a socialising and uniformizing force, it is at the same time the most potent single known factor for the growth of individuality'.

8.9

In his book, Language,(60) Sapir shows a concern with linguistic meaning, which contrasts with Bloomfield's approach. His analysis of the sentence, 'The farmer killed the duckling'(61) is instructive here, and in his approach to grammatical meaning, as also in his attitude

(60) E. Sapir: Language (1921), New York: Harcourt Brace; paperback, London: Rupert Hart Davis.

(61) E. Sapir: Language, Chapter 5, p. 82-119.

to semantics, Sapir may be seen as a more important influence on the work of some American linguists, including Sydney Lamb, than was Bloomfield.

8.10

In his essay 'The status of Linguistics as a Science' Sapir developed an interpretation of part of 'the very general function which language fulfils in the sphere of thought' in the following passage:

> The 'real' world is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached.

And, again:

> We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation.

8.11

When in his thirties, Whorf studied under Sapir at Yale and was deeply influenced by his writings, as indicated by the fact that he placed the passage just quoted at the head of one of his own later essays. Whorf, in his studies of North American Indian languages, developed the approach outlined in this passage, and arrived at an hypothesis about its implications which he called 'linguistic relativity'. Whereas Sapir went on from the remarks just quoted to talk of language as 'the symbolic guide to culture', Whorf proceeded to consider in depth the effect that language might have on culture. In a paper entitled: The relation of habitual thought and behaviour to Language,(62) he compares the North American Indian language Hopi on the one hand, with languages such as English, French, German and so on which he grouped together under the heading 'Standard Average European' (or S.A.E.) on the other. In it he puts forward the idea that language is a means of interpreting and systematising extra-linguistic reality, and that different types of languages perform this function in different ways. This may be compared with Hjelmslev's concepts of 'purport',

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(62) B.L. Whorf: 'The Relation of Habitual Thought and Behaviour to Language' (1939) reprinted in: Language Thought and Reality (1956), ed. J.B. Carrol, New York, and London: M.I.T. Press and John Wiley, p. 134-159.

'content-form', and 'content-substance' discussed above in 5.9 and 5.10. Taking the facet of extra-linguistic reality we know as time, which is a universal component of human experience anywhere in the world, Whorf shows that the treatment of it in Hopi is significantly different from that in S.A.E. Whereas in the S.A.E. languages one says 'ten days' in exactly the same way as one says 'ten bottles' or 'ten trees', as if the days could be stood in a row and counted separately, in Hopi there is only the sense of progressively becoming later: for the S.A.E. 'they stayed ten days', Hopi has the equivalent of 'they stayed until the eleventh day', or 'they left after the tenth day'. That is, in S.A.E. an imaginary discreteness and countability is postulated of units of time, but in Hopi this is not done and it is the sameness of a recurrent cyclical process which is stressed in the formal patterns of the language.

8.12

On the basis of examples such as this Whorf formulated the view that the language of a society not only reflects the attitude to extra-linguistic reality which that society has adopted through the ages, but also helps to perpetuate and form it; and that, so strong is the hold of this culture-determined and language-enforced world view, that it is almost impossible for an individua even to become aware of its power over him, and its determination of his unconscious assumptions about all aspects of reality, except by close contact with a different world view as codified and implicit in a typologically different language.

8.13

Sapir, then, was concerned with language and with the uses to which language is put in society. Whorf went one step further and taking one use of language in particular namely its role as interpreter of extra-linguistic reality - proceeded to consider not only the effect of culture on language, but the powerful effect of language on culture, and in particular its influence on cultural modes of thought. With Whorf the wheel has turned full circle. Other linguists have considered the influence of thought patterns on language, and the influence of society's needs on the language used to fulfil them. Whorf brings into the foreground the question of the influence of language on thought patterns, and on a society's awareness and formulation of its needs.

8.14

It may well be that in both relationships, that between language and thought, and that between language and its social uses, the influence is two-way. The work of Professor Bernstein at the London Institute of Education lies in this area(63) and is concerned with the way in which a Whorfian view of the effect of linguistic patterns on thought processes, and on unconscious assumptions about extra-linguistic reality, may be used to illuminate the causes of poor educational performance by children from linguistically deprived backgrounds: and also the reason for the gap between C.P. Snow's 'two cultures'. Bernstein may be seen as Whorf's chief 'academic descendant' in this country, though Halliday too has been influenced by him. In the United States linguist-anthropologists such as Dell Hymes(64) continue in

(63) B. Bernstein: 'A socio-linguistic approach to social learning', (1965) in: Penguin Survey of the Social Sciences 1965, (Penguin Book 2337), p. 144-168.

(64) D. Hymes: Language in Culture and Society (1964), (Harper International edition, 1966), Joint Publishers: Harper and Row; New York, Evanston, London. John Weatherhill, Tokyo.

the tradition of Sapir, as enriched and extended by Whorf.

8.15

No mention has yet been made of the study of dialects, that is of variations within one language which correspond with geographical divisions of the area in which that language is spoken. Much work has been done in this field, both in the last century and in this present one, particularly on the continent of Europe, in Britain and in the United States. In Britain, the Survey of Scottish dialects under Professor McIntosh at Edinburgh University has been in progress for some years, and the survey of English dialects at the University of Leeds has published much material, including, recently, their description of the dialects of South Western England. A survey of Welsh dialects is being conducted in the University of Wales at both Bangor and Cardiff. Among works of interest in this area of study are: Cockney phonology by Eva Sivertsen,(65) and English dialects by G.L. Brook.(66) Dialectology is an important part of sociologically

(65) E. Sivertsen: Cockney Phonology (1960), Oslo University Press.

(66) G.L. Brook: English Dialects (1963), London: André Deutsch, The Language Library.

oriented language study, and a good introduction to it may be found in Chapter 2 of R.H. Robins' book: General Linguistics: An Introductory Survey.(67)

9

A consideration of that vital and extensive area of linguistic science which has to do particularly with the sound patterns of languages, namely Phonetics and Phonology, has been delayed until now, in order that work in this field might be considered as a whole. The study of phonetics and phonology has been, and is, basic to all the schools of linguistics mentioned in this sketch, with the exception perhaps of those such as dependency theory and categorial grammar which are oriented particularly to machine translation and the written language. In the nineteenth century historical linguists based much of their work on the study of sound changes, and in the present century it was a renewed scientific interest in the sounds of languages which led to many of the advances in descriptive linguistics.

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(67) R.H. Robins: General Linguistics: An Introductory Survey (1964), London: Longmans.

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9.1

The theory of the phoneme, different versions of which were developed more or less simultaneously in several countries was at the heart of much of the work done in linguistics in the first half of this century, and is still of considerable importance. In Britain, Henry Sweet, the nineteenth century philologist, who did much work on Old and Middle English, was the first well known scholar to introduce the concept, though he did not name it as such, in his Handbook of Phonetics in 1877. In this century the London school of phoneticians, under the leadership of Daniel Jones, made important contributions in this area, together with producing very detailed phonetic descriptions of the one non-regional, and most highly socially esteemed, accent of British English, that known as 'Received Pronunciation', and work on general phonetic theory.(68) Jones was early concerned in colla-

(68) D. Jones: i) An Outline of English Phonetics (1918), ninth edition 1962, Cambridge: Heffer.

ii) The Pronunciation of English (1909), fourth edition 1956 (paperback 1966), Cambridge: Cambridge University Press.

iii) English Pronouncing Dictionary (1917) (Everyman's Reference Library), thirteenth edition, revised by A.C. Gimson, 1967. /iv borating with other European phoneticians in the production of the Alphabet of the International Phonetic Association, a measure of standardisation which has played an important part in the development of the subject.(69)

9.2

The study of phonetics in Britain has a long history,(70) going back to the seventeenth century, and it continues to be a major branch of linguistic studies: some of the

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(68) Continued

iv) The Phoneme: its Nature and Use (1950), second edition 1962, Cambridge: Heffer.

v) 'Some thoughts on the Phoneme' (1944), T.P.S. 1944, p. 119-135.

(69) The Principles of the International Phonetic Association (1949), reprinted 1963, London: International Phonetic Association. Department of Phonetics, University College London, W.C.1.

(70) R. Jakobson: 'Henry Sweet's paths towards phonemics' (1966) In memory of J.R. Firth (ed. Bazell, Catford, Halliday and Robins). London: Longmans, p. 242-254.

J.R. Firth: 'The English School of Phonetics' (1946), T.P.S. 1946, reprinted in Papers, p. 92-120.

D. Abercrombie: 'Forgotten Phoneticians' (1948), T.P.S. 1948, reprinted in Studies in Phonetics and Linguistics, London: OUP, 1965, p. 45-75.

principal centres for it are London, at University College and the School of Oriental and African Studies, Leeds, Cambridge and Edinburgh. In this country, and elsewhere, the study of phonetics has been closely bound up with the study of phonology. Phonetics may be described as the study and classification of all speech sounds and those differences between them which are perceptible to the human ear, while phonology is concerned with phonetic differences which function as meaningful distinctions in a given language. For example, in English, the 'l' sound at the end of a word such as 'fill' is phonetically different from the 'l' sound at the beginning of a word such as 'lift' but the language makes no phonological or meaningful distinction between these two phonetically different sounds as it does do, for example, between the sounds written 'p' and 'b' as in 'pore' and 'bore' which were mentioned earlier. The theory of the phoneme, as one approach to phonology, has to do with the setting up of categories to account for the flow of sound in a given natural language in terms of meaningfully distinct units.

9.3

However, Firth, who was at one time in the Department of Phonetics at University College London under Daniel Jones, made a far-reaching contribution to phonological theory with his concept of prosodies and phonematic units, and the so-called polysystemic approach to phonology, all of which differed in important respects from phoneme theory.(71) Prosodic phonology is a complex subject and those interested to know more about it are referred to R.H. Robin's book General Linguistics: an introductory survey. Here it is sufficient to say that it makes overt provision for handling the influence of neighbouring sounds on one another and the persistence of a phonetic feature over several segments, more readily than does phoneme theory; and that it allows the setting up of different phonological patterns to account for areas of a given language, such as loan words, or particular parts of the grammar such as verbal paradigms, areas which are isolatable on grounds other than the phonetic. Put more simply, proso-

(71) J.R. Firth: i) 'Sounds and Prosodies' (1948) in Papers in Linguistics, p. 121-138.
ii) with B.B. Rogers, 'The structure of the Chinese monosyllable in a Hunanese dialect (Changsha)' (1937), in Papers, p. 76-91.

See also the titles listed under note (53) above.

dic phonology takes into account the grammatical and lexical features of a language in setting up categories to systematise its sounds. In this way it is a more flexible approach than phoneme theory.

9.4

In Europe, Baudouin de Courtenay was the first to develop a concept of the phoneme. To quote Jakobson: 'Two world linguists, Henry Sweet and Jan Baudouin de Courtenay, both born in 1845, simultaneously and independently of each other coped with the same problems. In 1877, at the same time as Sweet's Handbook, there appeared in the Bulletin (Izvestija) of Kazan University the 'Reports on Baudouin de Courtenay's Studies in Linguistics during 1872 and 1873' with a brief plan of inquiry into the mechanism of speech sounds, their correspondences and their dynamic relationship, based on connections between sound and meaning'. In a work published in 1894, Baudouin de Courtenay became the first to make the explicit terminological distinction between sound or phone, and phoneme; 'he had super-posed this "morphologico-etymological part of the science of speech sounds" (comparable to morpho-phonemics) as a thoroughly linguistic discipline upon the auxiliary description of articulations and their acoustic effects'.(72) Jakobson mentions Jost Winteler, who published a work on the phonology and grammar of one of the dialects of Switzerland in 1876, as 'the third great precursor of modern phonemics among the linguists of Sweet's and Baudouin's generation'. Mikolaj Kruszewski, a close student of and collaborator with Baudouin de Courtenay, also played an important part in the early development of the phoneme 'name and concept'.

9.5

In the present century Nikolaj Trubetzkoy, a Russian member of the Prague School, was perhaps the most influential writer on the phoneme. His main work Grundzüge der Phonologie(73) was published in Prague in 1939 shortly before his death. Trubetzkoy included in his definition of the phoneme that it is not capable of being broken down

(72) R. Jakobson: 'Henry Sweet's Paths towards Phonemics' (1966), p. 245-6. See note (70).

(73) N. Trubetzkoy: Grundzüge der Phonologie: Travaux du Cercle Linguistique de Prague 7 (1939), Prague. Translated into French by J. Cantineau as: Principes de Phonologie (1949), Paris: Libraire C. Klincksieck.

into further successive units: 'those phonological units which, from the viewpoint of the given language, cannot be analysed into still smaller successive phonological units are called phonemes'.(74) His approach, like that of the other Prague phonologists, involved recourse to differences in meaning to establish the phonemes of a given language.

9.6

In the United States, phoneme theory has been the cornerstone of Bloomfieldian linguistics,(75) and is also central in Pike's theory of tagmemics.(76) However, just as Chomsky and his followers reacted against the Bloomfieldian approach in terms of its philosophical standpoint and linguistic methods, so too they have propounded somewhat different views in matters of phonology. One of

(74) J. Vachek: The Linguistic School of Prague, (1966), p. 45-46.

(75) L. Bloomfield: Language, chapters 5, 6 and 7; p. 74-126; especially chapter 5, p. 74-92, definition of the phoneme, p. 79.

(76) K.L. Pike: Phonemics (1947), Ann Arbor: University of Michigan Press.

Trubetzkoy's contemporaries in Prague was Roman Jakobson, and he took with him to America an approach to phoneme theory which he had begun to work on between the wars, and which is related to the 'correlational' approach of other Prague linguists such as Trnka(77) and Vachek. As early as 1936, Vachek had defined the phoneme as: 'a part of the member of the complex phonological opposition, a part which may be dissociated into simultaneous, but not into successive phonological units'.(78)

9.7

This Pragensian approach centred on those differences between speech sounds which are operationally effective in distinguishing words of different meanings in a given language.

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(77) B. Trnka: 'General Laws of Phonemic Combinations' (1936), reprinted in: A Prague School Reader in Linguistics, p. 294-300.

(78) J. Vachek: 'Phonemes and Phonological Units' (1936) in Travaux du Cercle Linguistique de Prague 6, Prague, p. 235-239, reprinted in: A Prague School Reader in Linguistics, p. 143-149. See: J. Vachek: The Linguistic School of Prague, p. 45.

9.8

The term 'phonological correlation' was defined as(79) 'a specific class of relevant phonic (i.e. phonetic) differences...constituted by a series of binary oppositions defined by a common principle, which can be abstracted from each couple of the opposed terms'. An example of such 'a common principle' would be 'the voiced versus voiceless character of consonants' in English or Russian. More simply, a 'phonological correlation' may be described as a series of pairs of phonemes, in which the members of each pair are distinguished from each other in terms of the same phonetic characteristic. 'The quality of correlation' is 'the opposition of the presence and absence of a certain phonic (i.e. phonetic) feature, which differentiates a number of phonological units (i.e. of phonemes) and which can be abstracted, in the given phonological system, from the opposed pairs'. That is, taking an example from English, the series of pairs of consonant phonemes: /p/b/,/t/d/,/f//v/,/s/z/...would constitute a phonological correlation, and the 'quality of correlation' underlying the series would be the opposition of the presence and absence of the phonic feature of voicing. The 'mark of correlation' in this example would be the phonetic feature of voice.

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(79) J. Vachek: The Linguistic School of Prague, (1966), p. 55-56.

9.9

As early as 1932, Jakobson had defined the phoneme as follows: ...'by this term we designate a set of those concurrent sound properties which are used in a given language to distinguish words of unlike meaning'.(80) This approach, as he later developed it, partly in collaboration with Morris Halle and Chomsky, has been adopted by linguists of the transformational school. Called 'distinctive feature analysis' it is based essentially, in practice, on phoneme theory, but seeks to go beyond it to open up possibilities for the statement of phonological universals, in a way in which phoneme theory by itself is neither designed nor equipped to do. Those interested in pursuing this subject further are referred to Fundamentals of Language by Jakobson and Halle,(81) to Chapter III,

(80) R. Jakobson: 'Phoneme and Phonology' (1932) reprinted in translation in Selected Writings (1962) I, p. 231-233. The Hague: Mouton (first published as 'Fonema' in Ottur slovnik naucny nove dobym a Czech encyclopedia, 1932).

(81) R. Jakobson and M. Halle: Fundamentals of Language (1956), The Hague: Mouton.

'Problems of Phonology', in The Linguistic School of Prague by Josef Vachek, and to an article by Morris Halle entitled 'On the Bases of Phonology'.(82)

9.10

In brief, distinctive feature analysis postulates a small set of criteria in terms of which, it is claimed, every phonological segment in any language may be adequately specified so as to distinguish it from all other such segments in the same language. That is, it is designed to specify properties of a segment of sound which distinguish it from other segments. The criteria used correspond largely in status with the 'qualities of cor-

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(82) i) Jakobson and Halle: Fundamentals, p. 28-32, (especially section 3.6., p. 28-9.)

ii) Morris Halle: 'On the Bases of Phonology' (first published 1958). A revised version printed in Jerry A. Fodor and Jerrold J. Katz (eds.): The Structure of Language: Readings in the Philosophy of Language (1964), Englewood Cliffs, New Jersey: Prentice Hall.

iii) Morris Halle: 'Phonology in Generative Grammar' (first published in Word 18 (1962) p. 54-72) reprinted in Fodor and Katz p. 334-352.

All subsequent page references to these last two Halle articles are to Fodor and Katz.

relation' of Pragensian phonology: one such criterion is voice (c.f. section 9.8 above). For example, the initial phonological segment in the English word bore is said to be plus voice, while that of pore is said to be minus voice, although their distinctive feature specifications are the same in all other respects (c.f. the discussion of this minimal pair in 9 above).

In this approach, phonological segments are viewed as 'bundles' of properties. One of the advantages of this is that general rules can be given for the use of a particular feature, so making it unnecessary to specify the particular kinds of phonological segments exhibiting that feature. Another advantage is that it makes it possible to compare the sound systems of different languages with reference to the use they make of the various distinctive features, on the assumption that, as is claimed, these features are universals equally applicable to the description of any and every language. This claim to universality is one of the attractions which Jakobson's approach holds for Chomsky, whose search for linguistic universals in grammar has been referred to in 3.3 above.(83)

/(83)

9.11

In reading further in the area of distinctive feature analysis, certain points might, however, be usefully borne in mind. Firstly, the term 'distinctive feature' appears to be sometimes used to mean a variable (a dimension of choice) and at other times to mean a value of such a variable (that is, an option actually selected along such a dimension). For example, the variable voice may be referred to as a distinctive feature, but so, too, may either of the values in this variable, namely, + voice voiced and - voice voiceless, which are mutually exclusive attributes of phonological segments. When the term 'distinctive feature' is used to refer to a variable (or dimension of assessment) such as voice, it corresponds

(83) i) Roman Jakobson: 'Implications of Language Universals for Linguistics' in Universals of Language, Joseph H. Greenberg, ed. 1963. 2nd edition, Cambridge, Massachusetts, M.I.T. Press. Chapter 9, p. 263-278.

ii) Noam Chomsky and Morris Halle: 'Some controversial questions in phonological theory'. J.L. 12, October 1965, p. 97-138, especially p. 98, 'Systematic reliance on features...permits a deepening of insight into linguistic competence'. See also p. 119-120.

with the term 'quality of correlation' as used in Pragensian phonology (see section 9.8 above). Where it is used to mean a value, such as voiced or voiceless, it partly corresponds with the term 'mark of correlation' as used by the Prague phonologists; but only partly because the latter term was used to describe the plus value of a binary variable, whereas the term 'distinctive feature' may be used to refer to any value of any variable, whether binary or not.

Secondly, in the version of distinctive feature analysis which has been incorporated into transformational-generative grammar the same set of named variables is used for making statements at the phonological level as is used at the phonetic. That is, a reference to the distinctive feature (= variable) of voice does not, of itself, inform the reader whether phonology or phonetics is being discussed. In this model, the phonological distinctive feature matrices specify the output of the lexicon, while the phonetic distinctive feature matrices specify the input to the speech production mechanisms. They are related to one another via the phonological rules. These rules either add to or modify features specified in the phonological matrices.(84) In the latter the main concern is to describe the underlying system of differences by means of which any given language builds up the stock of distinct morphemes which singly, and in certain combinations, constitute its lexical and morphological stock. The 'job' of the phonetic distinctive feature matrices, however, is to give a basic specification of what the morphemes described in a given language sound like when they constitute words and sentences. This is done in terms of Jakobsonian distinctive features which, it is claimed, constitute a theory of universal phonetics. These features (both variables and values in the variables) may be themselves specified either acoustically, as in Jakobson and Halle,(85) or in terms of articulatory phonetics, as in Halle.(86) The phonological rules relate the output of the grammar and lexicon to the phonetic facts, and in so doing are influenced in their own nature by both areas. Transformational generative phonology, like Firth's prosodic approach, with its emphasis on polysystemicness (see above, section 9.3), allows for the influence of both levels on the system of generalisations which relates them to one another.

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(84) Chomsky and Halle: 'Some controversial questions...' p. 120-121.

(85) Fundamentals, p. 28-32.

(86) 'On the Bases of Phonology', p. 326-327.

Chomsky and Halle write on this:

> The phonological component of a generative grammar relates the phonetic representation of an utterance to its syntactic structure. This syntactic structure consists of a string of formatives (minimal syntactically functioning elements) with a Phrase-marker determining the Immediate Constituent structure (the labelled bracketting) of this string. Applying the rules of the phonological component to a syntactic structure in a fixed and predetermined order, we derive the phonetic representation corresponding to this structure. In studying the organization and functioning of this system of rules, we found that we were able to isolate two levels of representation, corresponding to what Sapir called phonological and phonetic representation. We suggested the names *systematic phonemic* and *systematic phonetic* for these levels of representation. The systematic phonemic representation includes in addition to purely phonological elements also information about the morphological and syntactic structure of the utterance. The rules that relate the systematic phonemic representation to sound are *transformational* in that they take into account the Phrase marker of the string. 'Higher level' considerations play an important role in determin-

> ing the choice of this system, which is selected in such a way as to contribute to an optimal generative grammar of the language. The systematic phonetic representation utilizes a universal phonetic alphabet, based on a theory of distinctive features. For this purpose, we have adopted with some modifications Jakobson's theory of distinctive features, since this seems to us to be by far the best theory of universal phonetics now available.(87)

As the systematic phonemic and systematic phonetic distinctive feature matrices have different functions to fulfil, it is not perhaps surprising that, apart from operating with the same set of named distinctive features (= variables), they have little in common. Although the names of the variables are the same at both levels of representation, they differ in their characteristics as between the two levels in the following ways:

1) Each variable in the systematic phonemic set is binary; that is, it has only two possible values, plus or minus. In the systematic phonetic set a variable may have more than two values.(88)

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(87) Chomsky and Halle: 'Some controversial questions...', p. 98.

(88) Halle: 'Bases', p. 332-3.

2) In the systematic phonemics, certain variables may, in a given case, be adjudged non-relevant to the specification of a particular phonological segment. They are not, then, listed in the systematic phonemic distinctive feature matrix relating to that segment, so that, if the set of all variables is taken to number twelve, a full systematic phonemic specification of a segment may be made in terms of less than twelve variables. For example, take the word bee in English. Chomsky and Halle give its systematic phonemic specification, initially, in terms of the following distinctive feature matrix(89) (where the rows represent variables, the columns successive phonological segments):

Vocalic	-	+
Diffuse	+	+
Grave	+	-
Nasal	-	
Continuant	-	
Voice	+	

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(89) Chomsky and Halle: 'Some controversial questions...', p. 121.

That is, only six out of a possible twelve distinctive features (= variables) have been considered relevent to the systematic phonemic specification of the initial segment in this word. Further, only three variables are thought relevant to the specification of the second segment at this level of representation, its values in the others being considered predictable, either from context (as with _Nasal_) or by virtue of its selection in an already specified variable. For example, if a segment is _plus vocalic_, it is also always _plus voice_ in English phonology. Or, it may be that a variable is omitted because it is not a dimension of significant difference in the sound system of the language under analysis, or at least in some part of it. That is, a feature variable may be omitted because it is not, in a given case, distinctive. For example, the feature variable _Nasal_ is not distinctive with respect to the English vowels.(90)

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(90) i) Halle: 'Bases', p. 330.

ii) Halle: 'Phonology in Generative Grammar', p. 339.

In the systematic phonemics 'Each feature' (variable) 'corresponds to a pair of opposed categories, membership in one being indicated by a + and membership in the other being indicated by a –. These paired categories are mutually exclusive but not exhaustive. Thus certain entries may be blank, indicating that no information is given as to the membership of the segment in question with respect to the paired categories corresponding to the row in question. The phonological rules then fill in the blanks, modify entries where necessary, and replace the +'s and –'s by integers indicating degree, where the features correspond to phonetic scales'.(91)

A phonological (i.e. systematic phonemic) matrix, such as the one just given for bee is converted by phonological rules to a fully specified phonetic distinctive feature matrix, 'conventionally abbreviated as [biy] '. That is, in the systematic phonetics, no distinctive feature (variable) is regarded as non-relevant to the specification of any given segment of sound; each segment is described in terms of every member of the set of variables, even where its value in one or more of them is

(91) Chomsky and Halle: 'Some controversial questions...' p. 121.

fully determined by environmental or other factors.

3) In the phonology, the distinctive features have abstract denotations; that is, they are directly related to distinctions between the morphophonemes, combinations of which are the output of the lexicon; and only indirectly related to the phonetic facts. Chomsky and Halle describe the systematic phonemic representation of the word bee just given as 'a lexical categorization', while, 'the representation [biy] (in the full matrix form) is a phonetic specification of the corresponding item'. In this approach there is one and the same distinctive feature specification in the phonology for all the phonetically different allophones of any one phoneme; whereas each such allophone (see above, section 6.7) will have a unique specification in a phonetic distinctive feature matrix. For example, the two allophones of the phoneme /l/ in English, the 'clear' and the 'dark' 'l's' mentioned above (section 9.2) will have the same phonological distinctive feature specification, but different specifications in terms of phonetics. Further, in the phonological distinctive feature matrices, not only are allophones treated together, but information is also given

about what might be called 'allolexemes'. For example, Chomsky and Halle say, 'the word see in English must be assigned a categorial (phonological) representation that indicates that it takes irregular inflections, etc.'(92)

The same set of distinctive feature variables is made use of twice in the transformational generative model, at two different levels, for two different purposes. This means that the significance of a given value in a given variable will vary according to the level at which that variable is operating in a given instance. Conversely a given segment may have one value in a particular variable at one level, and a different value in the same variable at the other level without any contradiction.(93)

As previously mentioned, these two levels (the systematic phonemic or phonological, and the systematic phonetic or phonetic) are related to one another in this model by means of phonological rules which operate on phonological matrices either to add features (= variables) or to change features (= values of variables). The end product of the operation of the phonological rules is a phonetic matrix.(94)

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(92) Chomsky and Halle: 'Some controversial questions...' p. 122. See also, p. 121-98.

(93) Halle: 'Bases', III, p. 332-333.

Taking the phonological distinctive feature matrix just given for bee, in which the second segment was specified by only three variables, 'feature - adding' phonological rules may be illustrated. 'For example, one rule assigns the feature [+ tense] to the Vowel because of the fact that it is in final position'.(95) Another rule would, presumably, add [- Nasal] to the Vowel because it follows a non-nasal (oral) consonant.

Phonological 'feature-changing' rules might be illustrated by taking the word writer in American English, where the medial consonant, 't', is pronounced with voicing. In the systematic phonemic distinctive feature matrix this segment would be specified as, among other things, [- Voice]. In the phonetic distinctive feature matrix, however, this same segment would be specified as

(94) Chomsky and Halle: 'Some controversial questions...' p. 120.

(95) Chomsky and Halle: 'Some controversial questions...' p. 121.

[+ Voice] (among other things). The phonological rule linking these two different specifications at the two different levels of representation would state both, i) the nature of the feature (value) change and, ii) the phonological environment, that is, the conditions, in which it would apply. In this particular instance it would state that a medial alveolar stop specified as voiceless in the systematic phonemic matrix, would, if it occurred in a word in an intervocalic position immediately preceding an unaccented (unstressed) vowel, be specified in the systematic phonetic matrix as voiced.(96)

Finally under this heading: it has been emphasised that in the phonetic matrices (though not in the phonological) every segment must be assigned a value in every one of the distinctive feature variables. The converse follows from this: namely, that, in the phonetics, every distinctive feature variable is specified for every segment under focus. The distinctive feature variables in the phonetics are, thus, sometimes said to be 'universally applicable'.

(96) c.f. Halle: 'Phonology in Generative Grammar' p. 343.

4) The following point has already been made in a slightly different form under 3 above. Namely, that certain feature variables in the phonetic specification of a given segment of sound may not be distinctive for the class to which that segment belongs. As Halle says 'English vowels - i.e., segments that are $\begin{bmatrix}+\text{ vocalic}\\-\text{ consonantal}\end{bmatrix}$ - are all non-nasal, non-strident, voiced, and continuant.'(97) That is, segments which are specified in the systematic phonemics as [+ Vocalic] will not be specified there in terms of any of the four distinctive feature variables, Nasal, Strident, Voice, Continuant. There is not, for example, in English any pair of morphemes of different cognitive meaning which are distinguished from one another phonetically solely along the dimension of nasality with respect to a vowel. The phonetic feature (variable) Nasal with respect to English vowels has its value in any instance determined by the phonetic environment in which the vowel occurs, or, where this is not the case, by idiosyncratic variations among speakers: it does not correlate with differences of cognitive meaning. That is, in Pragensian terms, nasality does not operate

(97) Halle: 'P.G.G.' p. 339.

with respect to English vowels as 'a quality of correlation'. (c.f. Section 9.8).

This raises the question of whether or not it is strictly appropriate to use the term 'distinctive' to apply to the phonetic feature variables and the values in them. That is, if a 'distinctive feature' (variable) is taken to be a dimension of phonetic difference which is significant in a given language (i.e. different values in this variable correlate with differences in meaning among morphemes in the language), then only some of the feature variables specified in the phonetic matrices for a given language would also appear in the phonological matrices of the same language as being actually, operationally distinctive; and of these, some (e.g. Nasal) would only appear in the phonological matrices for certain classes of sounds (e.g. here, consonants). It might, therefore, be helpful to regard the phonetic feature variables as being potentially rather than actually distinctive.(98)

(98) Halle: 'Bases' p. 330, '...in every language only certain features or feature combinations can serve to distinguish morphemes from one another'.

This leads on to the claims that have been made that Jakobsonian distinctive feature theory constitutes a theory of universal phonetics.(99) These claims appear to be based on the view that 'all human languages are phonetically much alike'(100) and that a small set of different distinctive features (sometimes estimated as 12,(101) sometimes as 15 (102) 'are sufficient to characterize all segments in all languages'. Halle, writing of the version of this theory just discussed, which has been incorporated into transformational grammar, says that in the phonetics distinctive features are 'used to character-

(99) e.g. i) Roman Jakobson, C. Gunnar, M. Fant and Morris Halle: Preliminaries to Speech Analysis (1951) 6th printing 1965. Cambridge, Massachusetts: M.I.T. Press. p. 40: 'The inherent distinctive features which we detect in the languages of the world and which underlie their entire lexical and morphological stock amount to twelve binary oppositions'.
ii) Jakobson and Halle: Fundamentals section 3.6 p. 28-29.
iii) Halle: 'Bases' p. 328-9 and 333.
iv) Chomsky and Halle: 'Some controversial questions...' p. 120 and 98.

(100) Halle: 'Bases' p. 329.

(101) Jakobson, Fant and Halle: Preliminaries p. 40. Jakobson and Halle: Fundamentals p. 28-9.

(102) Halle: 'Bases' p. 329.

ize different aspects of vocal tract behaviour' and that, 'The statement that the assignment of phonetic interpretations to phonemic matrices is uniform for all languages reflects the fact that the articulatory apparatus of man is the same everywhere, that men everywhere are capable of controlling the same few aspects of their vocal tract behaviour. The phonetic features represent, therefore, the capacities of man to produce speech sounds and constitute, in this sense, the universal phonetic framework of language'.(103) That is, it is claimed that distinctive feature phonetics, by making use of a small set of variables, can adequately describe all possible dimensions of phonetic difference in the languages of the world (or at least those dimensions so far recovered).(104) It is not claimed, however, that any one given language will utilise all these potentially distinctive features in the organisation of its sound pattern. That is, it is not claimed either that, i) any language makes use of all the phonetic feature variables in its systematic phonemics, or that,

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(103) Halle: 'Bases' III, p. 332-333.

(104) Halle: 'Bases' p. 329. See also note 97, i) and ii).

ii) all languages make the same selection of phonetic feature variables for 'use' in their systematic phonemics.(105) It is, in fact, granted by phonologists of the distinctive feature school that the set of feature variables selected as being actually distinctive will vary among different languages: that is, in its entirety, the systematic phonemics of a given language is particular to that language, though it may have certain characteristics in common with that of one or more other languages. By relating systematic phonemics to a universal theory of 'feature phonetics' (universal in the limited sense outlined above) by means of phonological rules of a standard formal pattern, transformational phonologists ensure, however, that the systematic phonemics of different languages, while they may not be the same, are comparable in terms of a single phonetic framework, one which permits generalisations across languages to be made in, it is claimed, a particularly concise form.

(105) i) See Note 96 and
Jakobson, Fant and Halle: Preliminaries, p. 40. 'No language contains all these features' (i.e. all the 'inherent distinctive features' (12) that they 'detect in the languages of the world'.)

ii) Preliminaries, p. 10-11 and p. 6.

Chomsky and Halle go so far as to state that, 'All phonology breaks down if we do not assume analysis on the phonetic level in terms of universal phonetic features.'(106) Whether or not this is true, the claims made about the universality of phonetic distinctive feature theory should stimulate further fruitful research, and attempts to work in terms of such a theory, or to prove or disprove it, seem likely to lead to interesting results.

9.12

Distinctive feature analysis is similar in many ways to Firth's prosodic analysis.(107) Both systems pay particular attention to componential aspects in phonology: that is, both features and prosodies are themselves not segments, but characteristics of segments of sound. The two theories are not, however, by any means identical.

(106) 'Some controversial questions...' p. 119.

(107) See particularly

i) R.H. Robins: 'Aspects of Prosodic Analysis' in Proceedings of the University of Durham Philosophical Society, Vol. I Series B (Arts) 1. (1957).

ii) T. Hill: 'The Technique of Prosodic Analysis' In Memory of J.R. Firth, Bazell, Catford, Halliday and Robins, eds. (1966), London: Longmans, p. 198-226.

One of the respects in which they differ is in the length of the segments so characterised. Distinctive features relate to phonemes, or, as the term has now gone out of favour in the writings of transformational phonologists, one might say, 'phoneme-length phonological segments'.(108)

(108) In earlier work in distinctive feature analysis its relation to the Pragensian approach to phoneme theory (sections 9.6-9.9) was clear. More recently, however, Chomsky and Halle stress the independence of feature analysis from the phoneme concept, though, to the present writer, it seems difficult to divorce properties from the segments they may characterise, and to deny the latter linguistic significance. Both features and phonemes appear useful and necessary concepts in linguistics. In this connection, it may be noted that Firthian phonologists in setting up prosodies did not, as a result, feel compelled to abandon the concept of successive phonological segments which are significantly different from one another in a given language. (i.e. 'phonematic units').

Compare:

i) Jakobson, Fant and Halle: Preliminaries, p. 3. 'The distinctive features combined into one simultaneous or, as Twaddell aptly suggests, concurrent bundle form a phoneme.' p. 4: 'The difference between the distinctive features of contiguous bundles permits the division of a sequence into phonemes', and 'Any bundle of features (phoneme) used in a speech message at a given place in a given sequence is a selection from among a set of commutable bundles'.

p. 43: 'The phonemes may be broken down into the inherent distinctive features which are the ultimate discrete signals'.

/ii)

Prosodies, however, often characterise a combination of a vowel and consonant; or they may extend over a whole syllable or a complete word. For example, goose in English may be said to consist of three phonematic units with a prosody of lip-rounding extending over the whole word.(109)

(108) Continued

ii) Jakobson and Halle: Fundamentals, Chapter 2, especially, 2.1 - 2.3, p. 7-11. p. 11 '...the distinctive features and their combinations into phonemes'.

iii) Halle: 'On the Bases of Phonology', p. 325. 'In addition to viewing utterances as composed of phonemes, the phonemes themselves shall be regarded here as simultaneous actualizations of a set of attributes'. On the same page he also says: 'Only a few easily frightened souls have been ready to do without the phoneme'. Though, note p. 328, lines 5-8.

iv) Chomsky and Halle: 'Some controversial questions in phonological theory'. IV, 'The Status of Phonemes versus Features'. p. 119: 'We conclude...that only feature notation has linguistic significance, and that segments are simply to be regarded as conventional abbreviations, utilized to cope with the exigencies of printing but having no linguistic significance in themselves'.

(109) Though c.f. Preliminaries, p. 4, paragraphs 1 and 2, where Jakobson, Fant and Halle refer to the phenomenon of the 'suprasegmental extension of certain features'.

Another respect, as mentioned above, in which the two theories have something in common is in their approach to the relationship between the level of grammar and lexis and that of phonetics. That is, both theories allow grammatical and lexical factors to influence the shape of the phonology, rather than, as in some neo-Bloomfieldian work, allowing phonetic considerations to be paramount.

9.13

Some of the neo-Bloomfieldians, in an attempt to avoid recourse to meaning as much as possible, laid stress on the criterion of distribution for the establishment of the phonemes of a given language. This criterion if rigorously applied, to the exclusion of others, could lead to some doubtful conclusions. For example, in modern English, the sound [h] as at the beginning of high, and the sound [ŋ] as at the end of sing are in 'complementary distribution'; that is, they do not occur in the same phonological environment, and can therefore never contrast with each other in the same 'place'; one cannot construct a 'minimal pair', such as pore and bore for these two sounds. (To put it in Pike's terminology, they are not both potentially 'fillers' of the same 'slot'). That is, because [h] occurs only at the beginning of a syllable, and [ŋ] never occurs at the beginning of a syllable, they might, on the distributional criterion alone, be described as belonging to the same phoneme. In order to avoid such a conclusion a secondary criterion of phonetic similarity had to be introduced.

9.14

In spite of the Pragensian emphasis on phonetic differences in the distinctive feature approach, more weight is given to phonetic similarity between members of the one phoneme than is allowed in the preceding example. In practice, however, the Bloomfieldians often made use of the minimal pairs technique, as illustrated above with 'pore' and 'bore', and in this respect had something in common with Trubetzkoy, Jakobson and the Prague School, with Hjelmslev and his followers, and with Firth.

10

In this outline, considerations of space prevent much mention of work done in the area of psycho-linguistics, in spite of its significance and undoubted relevance to those interested in the learning processes and the development of language in children. Those wishing to investigate this area for themselves are referred to Psycholinguistics, a collection of papers edited by Sol Saporta;(110) Psycholinguistic Papers, edited by J. Lyons and R.J. Wales;(111) Psycholinguistics edited by C.E. Osgood and T.A. Sebeok;(112) and New Directions in the Study of Language, edited by Eric H. Lenneberg.(113) Other titles may be found listed in the Nuffield bibliography referred to in Section 8.

(110) S. Saporta (ed.): Psycholinguistics (1961), New York: Holt, Rinehart and Winston.

(111) J. Lyons and R.J. Wales (eds.): Psycholinguistic Papers (1967), Edinburgh: Edinburgh University Press.

(112) C.E. Osgood and R.A. Sebeok (eds.): Psycholinguistics (1965) Bloomington and London: Indiana University Press.

(113) Eric H. Lenneberg: New Directions in the Study of Language (1966), Cambridge Massachusetts: M.I.T. Press.

10.1

If one author only, however, is to be mentioned, the work of Frieda-Goldman Eisler may be singled out.(114) This deals chiefly with correspondences between pauses and other hesitation phenomena, and the planning procedures in the brain of the speaker, who is seen as using such devices to 'buy time' in which to organise what he is about to say. Some of Bernstein's earlier work was influenced by Dr Eisler's research, and hesitation phenomena play a part in the description of his restricted and elaborated codes.(115)

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(114) F. Goldman-Eisler: 'Discussion and Further Comments' (1964) in Lenneberg, op. cit. p. 109-130.

A. Henderson, F. Goldman-Eisler, and A. Skarbek: 'The common value of pausing time in spontaneous speech' (1965) in The Quarterly Journal of Experimental Psychology, XVII part 4, November 1965.

(115) B. Bernstein: 'Linguistic codes, hesitation phenomena and intelligence' (1962), in Language and Speech V, part 1, January-March 1962, p. 31-46.

11

In summarising this brief sketch of some of the different approaches to language in modern linguistics in terms of the three categories proposed at the beginning of this paper, the following rough generalisations are perhaps allowable. All the schools of thought mentioned have been principally concerned with the 'product' of my analogy: that is with language. However, with respect to the other two categories, there are differences. First, those engaged in dependency theory and categorial grammar, and in general those concerned with machine translation, may be said to be more *exclusively* concerned with the product than any of the other groups mentioned, though the Bloomfieldians, in spite of their references to behaviourist psychology, also tend to belong here.

11.1

Secondly, Chomsky, and those working in the field of transformational grammar may be said to be vitally concerned with the human faculty of language itself, and with the way in which the human brain acquires language and exploits this faculty, as well as with linguistic form.

de Saussure's dichotomy between language (la langue), which has system and order, on the one hand, and speech (la parole) which exhibits all the accidental features and untidiness of real life on the other, is a clear forerunner of Chomsky's distinction between competence and performance, and is acknowledged by him, though he differs in his view of the underlying nature of 'langue'.(116) de Saussure was also interested in the 'means of production', and writing of 'la langue' he says (in Baskin's translation): 'It is both a social product of the faculty of speech and a collection of necessary conventions that have been adopted by a social body to permit individuals to exercise that faculty.'(117) He allows, in fact, the influence of social factors on the formation and establishment of 'la langue', as Chomsky does not appear to do for his competence.

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(116) N. Chomsky: i) Aspects (1965), p. 4.

ii) Current Issues in Linguistic Theory (1964), The Hague: Mouton.

(117) F. de Saussure: Cours (1915), p. 25; Course, p. 9.

11.2

Hjelmslev was considerably influenced by de Saussure and may be grouped with him here on the basis of the important distinctions which he makes in Prolegomena on the one hand between 'content' and 'expression', and, on the other, between 'form' and 'substance', adding here, as a re-ordering and extension of de Saussure's ideas, the third category of 'purport', which he holds is the universal raw material of all language.(118) Lamb, in as far as he has been influenced by Hjelmslev's concepts,(119) may also be grouped here, though, in phonology, where his 'phonons' correspond closely to 'distinctive features',(120) and in his use of the concept and term 'realization',(121)

(118) Hjelmslev: Prolegomena, p. 47-58.

(119) S. Lamb: 'Epilegomena to a theory of language' (see note 25 above).

(120) S. Lamb: 'Prolegomena to a theory of phonology' (1966), Lg. 42, 2, p. 536-573.

(121) S. Lamb: (i) 'Linguistic structure and the production and decoding of discourse'.

(ii) 'On Alternation, Transformation, Realization and Stratification'.

(See note 17 above.)

he is nearer to the Prague school. Finally, Whorf's interest in the effect of language on modes of thought places him here rather than elsewhere, though he should perhaps be in a class on his own, or in company chiefly with Sapir.

11.3

Thirdly, the followers of Firth and Pike and of the Prague School although they differ in some important respects, may be grouped together here, as they are all concerned not only with the 'product', language, but also with the uses to which languages are put in human societies: that is, with linguistic form and function, and with the relationship between the two. Again, all of them emphasise the importance of the study of actual texts, whereas linguists of Chomsky's persuasion feel considerably more free to rely on the linguist's intuitions about his language, as a native speaker. Finally, Sapir, with his work on the relationship between culture and language, belongs more with this group than with any other.

11.4

Nothing, however, in the history of ideas is as clear cut as might be suggested by this outline which has been presented in a deliberately simplified way for the sake of giving some rough guide lines to those new or comparatively new to the subject. It should not be forgotten that Hjelmslev, too, placed emphasis on the study of texts, and that Halliday's systemic grammar, especially in its more recent developments, shares important common ground with Lamb's stratificational grammar as well as with work now coming from Prague.

11.5

On the basis of the most modern work in the different schools, it seems reasonable to conclude that linguists in the 1960s are, more and more generally, becoming concerned with all three of the aspects of general linguistics listed in the first section of the paper: and that it seems to be increasingly felt that the study of each aspect throws light on to the study of both the other two.(122)

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(122) Those interested in the history of linguistics are referred to: R.H. Robins: A Short History of Linguistics (1967), London: Longmans, and particularly to Chapter 8, 'Linguistics in the present century', p. 198-233.

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